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PLASTER OF PARIS AND MOLDING PLASTER IN CAGE CONSTRUCTION

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Plaster of paris and molding plaster ^{1/} have been found to be admirably adapted for making certain types of insect cages. These cages are especially useful when the desired moisture conditions are similar to those of the normal soil. They may also be placed in water, which results in the moisture rising through the porous material. Another desirable feature of molds made from these materials is that they may be readily bored into or carved. An ordinary bit easily bores into the mold and leaves a clean-cut hole. Any carving necessary can be readily done by means of sharp-edged tools, such as knives, chisels, etc. Carving is more easily accomplished within a day or so after the mold has set, as the moisture remaining in the mold at that time aids in the process.

One kind of cage used in studies of Apanteles diatraeae Mues., a larval parasite of the southwestern corn borer (Diatraea grandiosella Dyar), was made from molding plaster and proved to be very effective. Each cage was 14 inches square and 4 inches thick and consisted of a block (as shown in the accompanying figure) made by mixing the molding plaster and water. Holes, three eighths of an inch in diameter and 3 inches deep, were bored into one side of each block. After corn-borer larvae had been placed in the holes and each hole covered with an inverted vial, the blocks were buried about 6 inches deep in the soil of a corn stubble field, so that the closed ends of the vials extended above the surface of the ground. The plaster blocks absorbed soil moisture. Thus the corn-borer larvae were in a condition similar to the normal condition of the borers that are located in the tip of the tap roots of the corn stubs. As a result there was normal borer and parasite development and the parasite adults, which are positively phototropic, emerged into the vials.

Another kind of cage, for which both molding plaster and plaster of paris proved to be satisfactory material, was a colony cage used for studies in connection with the red harvester ant (Pogonomyrmex barbatus Wheeler). The cages made from these materials ranged in size from 12 inches long, 10 inches wide, and 3 inches thick, to 4 feet long, 12 inches wide, and 4 inches thick. The tunnels and chambers of the colony were carved on one surface of these blocks, and glass was placed over the surface, so that the tunnels and chambers were closed but the activities of the ants could be observed.

^{1/} Materials similar to molding plaster can be purchased commercially under different trade names.

Plaster cages were made by first making wooden forms the size and depth of the plaster blocks desired. Care was taken to make the forms as smooth and free from cracks as possible on the inside to prevent difficulty in removing the blocks after they had set. The forms were put together so that they could be loosened or taken apart to remove the blocks more easily. It was found desirable to let the nails holding the form extend from the surface so that they could be more easily pulled.

The powdered plaster of paris, or molding plaster, and water were mixed in a container large enough to allow for splashing and "slopping", which seem to be unavoidable. The most desirable utensil in which the materials were mixed accomodated roughly about twice the quantity of the ingredients actually used. Any bucket or tub, regardless of whether it is wood or metal, will suffice; it is more convenient, however, to have it fairly deep rather than shallow. In mixing the materials it was found more convenient to first put slightly less water than was needed in the container and then to add the powder, a little at a time, at the same time thoroughly mixing the material. The mixing can be done with a stick or paddle; the writer found, however, that mixing with one hand and adding the powder with the other was preferable. When the mixture reached the consistency of a watery paste and a greater quantity was desired, water and powder were added until the desired quantity was reached. If too much powder is added the mold will set rapidly, so care should be taken not to mix to a thick paste. When sufficient material had been mixed it was immediately poured into the form, where it set in a few minutes. The proportion of powdered molding plaster and water was found to be 0.6 pint of water to each pound of the powder. One pound of powder thus mixed resulted in 24.4 cubic inches of mold.

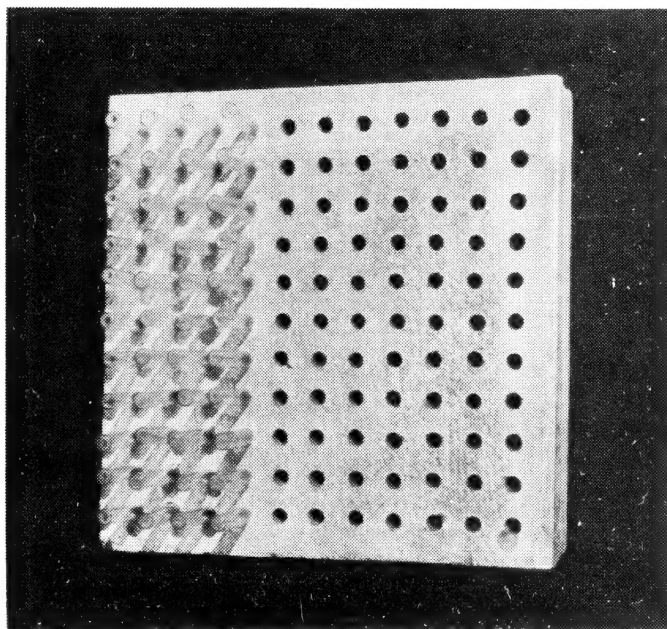
Although molds made from plaster of paris and molding plaster appear to be similar, they have certain differences. In the first place, plaster of paris cost the writer five times as much as molding plaster. Secondly, the molding plaster sets more slowly and allows more time for smoothing and working just before it hardens. This may be very important, as one may not have time to put the finishing touches to a mold of plaster of paris before it sets. The third point has to do with the porousness of the mold. Plaster of paris makes a mold that is harder and less porous than molding plaster. As an example of the value of increased hardness, the ant cages made of plaster of paris were more serviceable than those made of molding plaster because the ants could bite off pieces of the molding plaster more easily than they could the plaster of paris.

It is the writer's belief that materials such as those mentioned above can be advantageously adapted in a variety of ways.

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Cage, made of molding plaster, used
in studies of Apanteles diatraeae,
a larval parasite of the south-
western corn borer (Diatraea
grandiosella)

